

## MITOTIC INDEX OF PSORIATIC LESIONS TREATED WITH ANTHRALIN, GLUCOCORTICOSTEROID AND OCCLUSION ONLY\*

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### ABSTRACT

Nine patients with psoriasis were studied with regard to the effect of local medication on the mitotic index. Cordran® tape, anthralin and Blenderm® tape were compared with an untreated control. Applications were made 23 of 24 hours for 4 days before the biopsies were taken.

Statistically significant differences were seen in the mitotic index when comparing Cordran® vs. Blenderm® tape; Blenderm® tape vs. control; anthralin vs. control and anthralin vs. Cordran® tape.

This study was undertaken to determine the effect of a topical glucocorticosteroid, anthralin and occlusion alone, on the mitotic index of psoriatic plaques.

Fry and McMinn (1) demonstrated a decrease in the mitotic index of psoriatic plaques after the topical application (under occlusion) of methotrexate, glucocorticosteroid and anthralin. However, they did not determine the effect of occlusion alone on the mitotic index and it is possible that occlusion alone might decrease the mitotic index. The fact that they claimed a decrease with methotrexate made one suspect an effect from occlusion alone as other workers have shown no evidence of biologic effect of methotrexate applied topically (2, 3, 4).

Our studies show a definite depression of the mitotic index in psoriatic plaques after topical application of anthralin and fluorandrenolone acetone tape as compared to the untreated controls and to the controls of occlusion only. However, our studies show that occlusion alone will decrease the mitotic index

as compared to the unoccluded and untreated control.

### MATERIALS AND METHODS

Nine caucasian adults, ages 20-55, consisting of six males and three females with psoriasis were studied. None of the subjects had received any local or systemic therapy for their psoriasis for three months preceding our study. The following agents were applied to comparable lesions in the same region for twenty-three of twenty-four hours of each day for four days with renewal of the applications each twenty-four hours: (a) Cordran® tape 4  $\mu\text{g}/\text{cm}^2$ ,§ (b) Blenderm® tape, (c) anthralin 1/4% in Lassar's paste applied thickly and covered only with gauze roll, (d) the control site had no application of any kind during the four day experimental period.

At the end of four days, 4 mm punch biopsies were taken from each site and fixed in Bouin's solution. Sections were cut at 7 microns and stained with routine H&E. Serial sections were made from each block. However, four sections were utilized in each determination of the mitotic index. The sections which were counted were at least six sections apart from each other. The number of mitoses per 1000 interfollicular basal cells was determined for each specimen. Any epidermal cell in mitosis and in the layer above the basal cell layer was also counted and included in the mitotic index.

Statistical analysis of the data was based on the "t" test (5).

### RESULTS

The Table lists the mitotic index for each area of skin on each subject.

§ Supplied by Eli Lilly Company, Indianapolis, Indiana and containing 4  $\mu\text{g}/\text{cm}^2$  of flurandrenolone acetone.

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Statistical analysis of the data shows that the mitotic index of the Cordran® treated sites is less than the Blenderm® tape alone and control sites with a p value of 0.01. The Cordran® sites showed a lower mitotic index than the anthralin sites (p = 0.05).

It is of interest that the Blenderm® tape alone showed a lower mitotic index than the control site (p = 0.01). Anthralin treated sites had a lower mitotic index than the controls (p = 0.01).

DISCUSSION

It is known that glucocorticosteroids can inhibit mitosis in the regenerating liver of mice (6, 7) and rats (8, 9, 10), the epidermis of mice (11, 12, 13) and bone marrow of hamsters (14).

Glucocorticosteroids cause an increase in mitoses in the young rat incisor (15) but various effects of glucocorticosteroids have been reported on mitoses (stimulation, inhibition or no effect) in various tissues (16). Bullough and Lawrence claim that glucocorticosteroids influence mitosis by prolonging the action of a proposed chalone-adrenalin complex (17).

Fry and McMinn (1) have demonstrated a decrease in mitotic index in psoriatic lesions with topical glucocorticosteroids and anthralin

paste. Their studies did not include a control with occlusion alone and our studies show that occlusion alone can decrease the mitotic index but not to the extent of topical glucocorticosteroids. Recent studies by Halperin *et al.* (18) show a decrease in carbohydrate metabolizing enzyme activities in psoriatic lesions treated with occlusion alone. However, they demonstrate a greater drop in these enzyme activities with topical glucocorticosteroids.

The relationship of depression of the mitotic index to clinical response of psoriasis to such drugs as methotrexate, anthralin and glucocorticosteroids is unknown. However, one must consider this as a point in common for these drugs which are known to be effective in resolving psoriatic plaques.

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TABLE

Pt. No.	Mitotic Index (No. of Mitoses Per 1000 Cells)*			
	Cordran® Tape	Blenderm® Tape Alone	Control	Anthralin
1	3	12	17	1
2	2	20	29	Not done
3	9	10	15	7
4	0	17	20	10
5	7	8	20	12
6	6	19	17	16
7	0	6	23	8
8	2	14	21	6
9	0	11	15	4

Cordran® tape < Blenderm® tape - p = 0.01.  
 Cordran® tape < Anthralin - p = 0.05.  
 Blenderm® tape < Control - p = 0.01.  
 Anthralin < Control - p = 0.01.  
 \* Total cells counted = 1000.

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